

CURVED DISPLAY APPARATUS

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application is a continuation application U.S. patent application Ser. No. 14/289,868, filed on May 29, 2014, which claims the benefit of U.S. patent application Ser. No. 61/828,250, filed on May 29, 2013 in United States Patent and Trademark Office, and Korean Patent Application No. 10-2013-0071615, filed on Jun. 21, 2013 in the Korean Intellectual Property Office, the disclosures of which is incorporated herein by reference, in their entireties.

BACKGROUND

[0002] 1. Technical Field

[0003] Apparatuses of the exemplary embodiments relate to a curved display apparatus having a display with both lateral ends protruding forward.

[0004] 2. Description of the Related Art

[0005] A display apparatus is a device that generally receives image signals and displays images. Examples of the display apparatus may include a television and a monitor.

[0006] Recently, a display apparatus having a display formed in a curved shape with both lateral ends protruding forward, relative to the central portion of the display, to make two-dimensional images look three-dimensional, to some extent, has been proposed.

SUMMARY

[0007] An aspect of the exemplary embodiments provide a curved display apparatus having a support structure suitable for a display which is curved, such that both lateral ends thereof of the curved display protrude forward relative to the central portion of the display.

[0008] Additional aspects of the exemplary embodiments will be set forth in part in the description which follows and, in part, will be obvious from the description, or may be learned by practice of the exemplary embodiments.

[0009] In accordance with one aspect of the exemplary embodiments, a display apparatus includes a display curved such that opposite lateral sides thereof protrude forward, and a support frame having a lower end supported on a horizontal surface and allowing the display to be disposed inside thereof, wherein opposite lateral sides of the support frame protrude forward such that the support frame is curved to correspond to the display.

[0010] The support frame may be formed in a shape of a quadrangular ring.

[0011] The support frame may have a curvature equal to a curvature of a rear surface of the display.

[0012] A front surface of the display may have a smaller curvature than a curvature of the rear surface of the display.

[0013] The support frame may include an upper frame and a lower frame spaced apart from each other in a vertical direction and extending in a horizontal direction, and a pair of side frames extending in the vertical direction to connect both lateral ends of the upper frame to both lateral ends of the lower frame, wherein each of the upper frame and the lower frame may be curved such that the lateral ends thereof protrude forward relative to a central portion thereof.

[0014] The display apparatus may further include a camera allowing use of a video call.

[0015] The camera may be installed at the support frame.

[0016] The support frame includes a pair of main speakers disposed at both sides of the support frame.

[0017] The main speakers may be disposed at opposite sides of the lower frame.

[0018] The display apparatus may further include a leg installed at least at one of the display and the support frame to allow the display and the support frame to remain standing.

[0019] The display and the support frame may be installed at an incline such that an upper end of each of the display and the support frame is rearwardly inclined.

[0020] The display may include a display panel and a bottom chassis, the bottom chassis is curved such that both lateral ends thereof protrude relative to a central portion thereof to support a rear surface of the display panel, wherein the display panel may be attached to the bottom chassis and deformed to be curved in a shape which corresponds to the bottom chassis.

[0021] The display panel may include an organic light emitting diode panel.

[0022] The display may further include a reinforcement member disposed at the bottom chassis to enhance the strength of the bottom chassis.

[0023] The reinforcement member may be disposed on a front surface of the bottom chassis, wherein a heat dissipation sheet allowing heat to be easily distributed and an insulation sheet formed of an insulation material may be disposed, between the display panel and the reinforcement member.

[0024] The display may have a thickness which gradually decreases from a central portion of the display to both lateral ends of the display.

[0025] The display may include the bottom chassis curved such that the both lateral ends thereof protrude relative to the central portion, and at least one printed circuit board disposed on a rear surface of the bottom chassis, wherein the bottom chassis may include a plurality of studs allowing the at least one printed circuit board to be installed at and spaced apart from the rear surface of the bottom chassis.

[0026] The plurality of studs may have a height which gradually decreases from a central portion of the bottom chassis to both lateral ends of the bottom chassis.

[0027] The display may further include a sub-speaker installed on a rear surface of the bottom chassis, wherein a thickness of the sub-speaker may gradually decrease as the sub-speaker extends from a point close to a central portion of the bottom chassis to a point close to a lateral end of the bottom chassis.

[0028] The display may include a display panel to display images, a bottom chassis curved such that both lateral ends thereof protrude forward, and at least one printed circuit board installed at the bottom chassis, wherein the at least one printed circuit board may include a power board configured to supply power, a panel drive board configured to transfer the power to the display panel, a timing control board configured to transfer an image signal to the display panel, and a signal processing board configured to process image signals and sound signals.

[0029] The power board may be divided into two parts and installed at the bottom chassis.

[0030] The power board may be disposed at a center of the bottom chassis, the panel drive board may be disposed at a center of an upper portion of the bottom chassis, the timing control board may be disposed at one side of a lower portion